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Centerline

An Environmental News Quarterly, From the NCDOT Natural Systems Unit

Viewpoint: North Carolina Wildflower Program

By: Bill Johnson
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Bill, one of NCDOT's finest, is retiring October 1st after 30 years of service. Bill has headed up the Roadside and Environmental Unit for 24 years. A Native and resident of Bullocks in Wilson County, he and his wife, Ann, have two daughters, Leigh Ann and Paula. Bill plans to spend part of his retirement time farming and operating a Snapper Lawn Mower Business. Best wishes to you in your retirement. We will miss you!

Our wildflower program began in 1985 after we received encouragement from a number of individuals and garden clubs to start such a program. We had initially tried planting wildflowers in the early 1970's but were unsuccessful because of a poor seed supply. The seed supply in 1985 had improved significantly and we were able to see from the 12 acres planted that year that such a program could be successful.

Our program now consists of planting approximately 350 acres of wildflowers each fall and we have a total acreage of over 3,000 acres statewide. In the fall, we prepare beds and seed and mulch the wildflowers, which form rosettes during the winter and then are ready to offer us the tremendous spring blooms we all enjoy.

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In this issue:

An Alliance with the Divisions

By: LeiLani Paugh, NCDOT Environmental Specialist
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NCDOT's mitigation program has grown tremendously over the past several years to meet the demands of an ambitious transportation improvement program and evolving environmental regulations. The Natural Systems Unit has formed a new alliance with several Divisions across the state to meet our mitigation needs.

Division 2 identified the Grimesland Site, a mosaic of borrow pits and uplands situated on the floodplain of the Tar River off Hwy 264 near the Pitt and Beaufort county lines. Allen Lewis, Beaufort County Maintenance Engineer, coordinated the Division efforts during the planning and construction of the site. In the photo, the maintenance crew, under the watchful eyes of Eddie Gurganus, graded the uplands and berms while filling the borrow pits to the target elevation of the adjacent wetland. The second photo is post construction of the site, showing the established wetland in the background and the newly constructed wetland in the foreground.

Division 2 also constructed the ABC mitigation site in Beaufort County near Pinetown. Bobby Jones directed the construction crew as the site topography was manipulated to simulate the reference non-riverine wetland.

On the other end of the state, Division 14 is constructing the Tulula stream restoration project in Graham County under the direction of assistant district engineer, Wesley Grindstaff. As shown in the photo, a new channel is being constructed, reconnecting the stream to its floodplain.

Other Divisions across the state have assisted with our mitigation projects. Division 9 took on the intricate task of wetland restoration in bog turtle habitat at the Friedburg Mitigation site. Division 6 in Robeson County is maintaining the ditches and roads on the Juniper Bay site while we gather

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We plant about 20 annual and perennial species in our program. The first species to bloom in spring is the multi-colored Toadflax. Soon the bright orange California Poppies and "Wolfpack red" Red Corn Poppy blooms. Several perennial species including OxEye Daisy and Lance-Leaf Coreopsis are blooming in the spring along with the brilliant pink of Catchfly. Many beds of white Ox-Eye Daisy and the brilliant blue of Dame's Rocket form a dramatic and beautiful color contrast. Later comes the tall summer blooms of Plains Coreopsis and the gardener's standby Black-Eyed Susan.

Our effort to achieve a longer blooming period and find species to bloom in the fall was solved when we began planting the two cosmos species we use, Sulfur and Bipinnatus. These two species are very easy to cultivate and be successful with. Additionally, we found several native species for fall blooming that we were interested in and began collecting seed. We have planted these seed including Nan'ow Leaf or Swamp Sunflower and Bur-marigold and also some New England Aster at the forestry farm near Goldsboro. This is so we can increase seed and distribute statewide. We have been harvesting from this planting about 2,000 pounds of cleaned Bur-marigold seed. Bur-marigold gives a beautiful golden yellow fall color in the month of September.

Wildflowers require considerably less maintenance than landscape beds. Areas are mowed down in the fall after bloom and our perennial species including Ox-Eye Daisy and Lance-Leaf Coreopsis will bloom several years after that. The native Bur-marigold species, even though it's an annual, will reseed prolifically and reestablish in these beds. We have also seen it reestablishing along fringe areas in adjacent right-of-way.

The wildflower program that we have been involved in for 16 years now is by far our most popular roadside beautification effort. The program is enthusiastically supported by The Garden Club of North Carolina, which sponsors a yearly awards program. We receive calls and e-mails from all over the United States and have received several letters from Europe and Canada about our Wildflower Program. Most all our southeastern neighbors have consulted with us on how to establish such a program. We have talked with most all the states east of the Mississippi about our wildflower program.

When we are asked about the North Carolina Wildflower Program, the one thing that we, without failure, say is that it's because of our Roadside Environmental people in the field that this program is so successful. The Division Roadside personnel are agronomically trained and have a very keen interest in making our roadsides beautiful for our own citizens and the traveling public. They have done an excellent job with this program and have received numerous awards for their efforts. We salute them for making such a great and successful program.

Washington State Environmental Leader Visits NCDOT

By: V. Charles Bruton, Ph.D.
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Ms. Shari Schaftlein, Deputy Director of Environmental Services, Washington State DOT, visited with several representatives of the Natural Systems Unit during a recent business trip to the Triangle area. In addition, discussions were held with Ms. Janet D'Ignazio, Chief Planning and Environmental Officer and members of her staff. Recent environmental initiatives that both WSDOT and NCDOT are involved with were highlighted. Ms. Schaftlein, who directs the development of policies, procedures, and plans for her State's program, identified several critical and emerging issues that she had been involved with at both the State and National level.

Several staff members of PDEA and the Hydraulics Unit spent the afternoon in the field with Shari reviewing recent stream and wetland mitigation initiatives. The Oakwood Cemetery stream restoration site as well as Dutchman's Creek were visited. Exchange of mitigation strategies of value to both state DOT's were discussed.

NCDOT would like to thank Shari for taking time from a busy schedule to visit and share similarities and differences in our two Natural Resources Programs. Several NCDOT staff biologists commented that exchange of ideas in this type setting, between different DOT programs, would be extremely beneficial in the future.

Shari views Dutchman's Creek site with staff.

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Grimesland Mitigation Site (Before)

Grimesland Mitigation Site (After)

baseline data and develop the site plans.
The work the Divisions provided has played a large role in the overall success of mitigation on these sites. The Natural Systems Unit is excited about several other opportunities to work with the Divisions on our mitigation sites. The knowledge and skills the Division personnel contribute to our mitigation efforts have been ignored in the past but have the potential to be a great asset to our program.

Tulula Mitigation Site

T&E Box Scores

By: Michael Wood

"In the sports section of most newspapers, there are the baseball box scores, short, statistical lists recapping the previous games. Our version recaps the significant discoveries, by our staff, of threatened and endangered species in North Carolina."

Name	Species	Location	Occurrences	Category
Pinewoods shiner	*Lythrurus matutinus*	Nash	1	fish
Creeper	*Strophitus undulatus*	Franklin	1	Mussel
Carolina creekshell	*Villosa vaughanianas*	Alamance	1	Mussel
Eastern lampmussel	*Lampisilis radiata*	Halafax	1	Mussel
Carolina creekshell	*Villosa vaughanianas*	Cabbaras	1	Mussel
Brook floater	*Alasmodonta varicosa*	Burke	1	Mussel
Spike	*Elliptio dilitata*	Ashe	1	Mussel
Green floater	*Lasmigona subviridus*	Watauga	1	Mussel
Eastern lampmussel	*Lampisilis radiata*	Montgomery	1	Mussel
Brook floater	*Alasmodonta varicosa*	Randolph	2	Mussel
Carolina creekshell	*Villosa vaughanianas*	Randolph	2	Mussel
Heller's trefoil	*Lotus helleri*	Mecklenberg	2	Vascular plant

Hat's Off to Charles Cox

Charles Cox, Natural Systems Engineer, and his wife were part of a team of 15 people who participated in a 24-hour "Walk for Life" relay on May 19, 2001, which was sponsored by the American Cancer Society. Due to generous contributions from co-workers, this team was able to raise over $3,500 for the organization.

Hat's Off to Jared Gray

Jared Gray participated in a Homerun Derby to fund a church building mission to Honduras, through Environmental Specialist, LeiLani Paugh's, Church. Jared hit 3 homeruns before suffering a minor injury. Jared raised over $100 with his homeruns and LeiLani's church raised over $1,500 for the mission to Honduras.

Hat's Off to Alice Gordon

Alice Gordon was recently nominated for the 2001 Governors Award for Excellence. Alice has been a member of the PDEA staff for 6 years and plays a significant role in NCDOT's Permit Process. Prior to joining NCDOT, Alice worked in both the public and private sector as a biologist. Keep up the Good Work, we are proud of you!

The Enhancement Program - Past, Current and Future

By: Laurie Smith, Enhancements/Agreements Administrator
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The Enhancement Program was established by Congress in 1991 through the Intermodal Surface Transportation Efficiency Act (ISTEA) as a means of ensuring that a variety of projects, most not typically associated with road-building, were implemented. The widespread embracement of this program nationwide led Congress to reauthorize the Enhancement Program in 1998 through the Transportation Equity Act for the 21st Century (TEA-21). TEA-21 provides record investment to move beyond concrete, asphalt and steel to build a better America by improving safety, protecting the environment and public health, and creating an opportunity for all Americans to improve their quality of life through Transportation Enhancements.

Initially, only established departmental objectives were supported with enhancement resources. With TEA-21, NCDOT established an internal work group, with FHWA as a partner, and external focus groups representing many diverse disciplines to improve the administration of the program. Program administration was further refined after the first Call for Projects by a focus group and the DOT Board. The current distribution of funds (internally to DOT divisions, as well as externally to communities across the state) serves to meet the needs of the state as well as our communities.

Internally, the Division of Bicycle and Pedestrian Transportation receives Enhancement funds for implementation of a statewide bicycle program, both on-road and off-road. The Rail Division receives Enhancement funds for the restoration of active historic rail stations. Each of DOT's Highway Divisions receives an equal annual allocation for pedestrian and landscaping projects. The Roadside Environmental Branch administers the Wildflower and Scenic By-Ways Programs. The Wildflower Program, an integral part of highway beautification, utilizes Enhancement funds to establish and maintain wildflower beds along our highways. The Scenic By-Ways Program receives Enhancement funds to identify and highlight scenic roads with unusual, exceptional, or unique intrinsic qualities for public enjoyment.

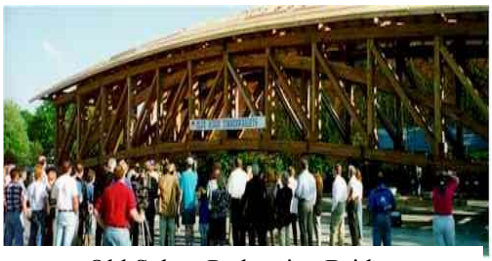
Externally, projects are awarded to communities through a statewide Call for Projects. Communities implement these projects and receive funds on a reimbursement basis. Awards were distributed during the 1999 and 2000 Calls for Projects. May 2000, the BOT adopted Program goals and a selection process with four Enhancement Advisory Councils. To date, $36 million has been awarded to communities to implement more than 160 projects. The next Call for Projects is planned for 2002. The Call for Projects continues to receive positive responses from citizens across the state and out-of-state.

In-Stream Constructed Wetlands & Channel Restoration

PD&EA staff provides valuable assistance to the Enhancement Program. The Natural Systems Unit reviews projects for adherence to the National Environmental Policy Act. The Historic Architecture Group provides close coordination with the State Historic Preservation Office regarding projects affecting historic districts.

With Enhancement funding, communities can partner with the state to create and preserve treasures that can be enjoyed for generations. New and creative ideas are funded to preserve history, expand transportation options, support economic process and improve the environment.

To learn more about the program, visit the webpage at: www.dot.state.nc.us/planning/development/Enhancement/Program/



Old Salem Pedestrian Bridge

Project Spotlight: Sanford Bypass, on the Road to Completion

By: Eric Black, NCDOT Environmental Specialist
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The Sanford Bypass, R-2417, is a greatly needed roadway for the city that lies in the well-traveled path of central North Carolinians. US 421 is a highway that connects Fayetteville and Greensboro, and runs through the middle of downtown Sanford. Traffic congestion in Sanford is a problem and the bypass seeks to provide a solution.

The bypass will be a northern connector of US 421 to NC 87. The stretch will be approximately 12.2 miles of new location. New location projects have the potential to have much greater impacts than other types, such as widenings, resurfacings, or replacements. The new location combined with the Sanford Bypass's rural path can make the planning and analysis for avoidance and minimization an intricate process. The Sanford bypass has been no exception.

Through careful design, the proposed 12.2 miles is only planning to impact 11.06 acres of wetlands in two hydrologic units of the Cape Fear River basin (HU's 03030003 and 03030004). Hydrologic Units are geographic classifications used to reference locations. Some high quality wetlands will be bridged. Bridging is a new process being used in avoidance and minimization practices, protecting both the environment and the efficiency of the highway. In the remaining acreage of wetlands, mitigation is required. The Wetlands Restoration Program (WRP), administrated by NC DENR, has contracted to mitigate half of the impacts, and the DOT is mitigating the rest with riverine restoration from the Sandy Creek mitigation site, and 11.05 acres of preservation from its Blue mitigation site located on the Little River.

Stream surveys for the proposed bypass located 53 jurisdictional streams within the project area. The proposed stream impacts are approximately 23,640 linear feet. The WRP has contracted to mitigate for those stream impacts occurring in HU 03030004. DOT has the stream mitigation options pending for those impacts occurring in HU 03030003, and hopes to soon find a resolution.

At this time, all the environmental impacts have been taken into account, including possible impacts to endangered species. Three species are listed as Threatened or Endangered for Lee County, North Carolina. These species include harperella, Cape Fear shiner, and the red-cockaded woodpecker. No species individuals were found in previous surveys. If found, section 7 consultation will be required with the United States Fish and Wildlife Service (USFWS) which would lead to more mitigation.

Blue Mitigation Site—Bottom Hardwood Wetland Mitigation (preservation) for the Sanford Bypass.

Permit authorization is required from the Army Corps of Engineers as well as the North Carolina Division of Water Quality. The permitting process can be arduous, when having to negotiate all of the aspects involved. With the approval of the agencies, the hurdle of obtaining the permits will be reached, and barring any permit modifications, the Sanford Bypass will be on it's way to construction, and closer to completion.

The residents of the city of Sanford look forward to the long awaited relief from hometown traffic and travelers look forward to a speedier and easier route.

PCN Production 101

By: Lenwood Smith, Division 7 Environmental Officer
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DEO Prospective: Featuring an article from a Division Environmental Officer.
This quarter's segment is brought to us by Division 7, located in the Piedmont Region of the state.

February 15, 2001 was a significant date for Division Seven. Coupled with the earlier loss of Nationwide Permit 26, the US Army Corps of Engineers (USACE) decision to no longer authorize secondary road impacts under Nationwide Permit 3 had the effect of requiring all secondary road projects impacting waters of the US to be authorized by the USACE or Division of Water Quality (DWQ) prior to construction. This authorization requirement resulted in a need for an efficient method to produce Pre-Construction Notifications (PCNs) requesting authorization from the USACE or DWQ to impact waters of the US. This article provides a brief overview of Division 7's PCN submittal process.

The most common PCNs associated with secondary roads in Division 7 are for intermittent and perennial stream impacts. These PCNs are produced by selected representatives in each of the three districts comprising Division 7. PCN production for a project begins by submitting a request to the Division Environmental Officer (DEO) for the Natural Resource Review Sheet and Endangered Species Review Sheet. These two sheets provide the district representative with the background information necessary to produce the PCN. Upon receipt of these sheets, the district representative produces the PCN using form cover letters, typical construction sequences, and a checklist for administrative completeness. The form letters and construction sequences (developed with assistance from Dennis Johnson, Bridge Maintenance Engineer) are protected documents containing drop down boxes and text boxes that direct the district representative to fill in necessary information. The administrative checklist provides a list of items to be provided with the PCN such as a check to the DWQ, cover letters, the PCN form, maps, etc; and copying and mailing directions for the completed and DEO reviewed PCN.

Benefits of this process include incorporation of districts into the permitting process, prevention of bottlenecks, and increased communication among the participants. Future goals in the PCN production process include development of a protected PCN form with drop down boxes and text boxes, and development of a protected form letter for wetland impacts.

Detours

It is difficult to merge highways and the environment. One method to aid wildlife is to provide crossings when roads bisect their habitat. Help the critters find their way by correctly matching the species with its habitat:

Species
1 Red Wolf
2 black bear
3 Salamander HELLBENDER (Cryptobranchus alleganiensis)
4 American alligator,
5 Carolina Heel splitter freshwater mussel
6 Manager
7 Engineer
8 Biologist

Habitat

A-Rivers and wetlands in Southeastern, NC. Coastal North Carolina is the northern most range. Ample food supply of fish, turtles, snakes, and small mammals are required.

B-Found near openings or in crossings, usually having notebooks, binoculars, and/or electrical shocking equipment. Often seeks company with engineers, but strongly prefer others of its kind.

C-Found in western NC in large, clean, fast flowing streams under large, flat rocks, mainly in streams of the Miss. Drainage system.

D-Often found entering Conference rooms, swivel chair seating available, large tables, prefers temperatures ranging from 62 to 71 degrees F. Food requirements of coffee and sometimes donuts should be present, usually similar looking species will be present and appear more alert when aware of the introduced specimen.

E-Found in small, 6 by 8 foot, walled in locations with semi-open cover. Found to need a mouse before location is sufficient. Any vegetation is usually potted and dead.

F-coastal prairie and marsh in southeastern US, 25 to 30 square mile home range. Heavy vegetation for cover.

G-Prefers a sedentary lifestyle and does not use crossings.

H-Present in Southern Appalachian Mountains and the coastal bays and swamps of NC. Old hardwood dominated forests containing a variety of mast producing tree and shrub species. Typically require extensive, rugged country with dense thickets, swamps, bays, or rock outcrops, with opportunity for omnivorous food requirements.

Highway Runoff effects on Freshwater Mussel Health

By: Dr. Jay F. Levine, College of Veterinary Medicine, NC State University

Contamination of freshwater {ecosystems} by highway runoff is a growing concern. {Pollutants entering surface waters challenge the health and well being of aquatic organisms.}
Freshwater mussels are living filters, they remove algae and other organic suspended particles from the water column. Mussels serve as food for various wildlife species, and also serve as bioindicators of ecosystem health. These aquatic inhabitants, however, are in decline and their abundance and diversity are the focus of a recently implemented project; "Assessment of highway runoff on the health of freshwater mussels." The effort is funded by a partnership between The North Carolina Department of Transportation (NCDOT) and the North Carolina State University's Center for Transportation and the Environment (CTE),

Of North Carolina's 49 species of freshwater mussels, two thirds are listed as endangered, threatened, or of special concern. Contributions to the decline are {habitat} changes, and contaminants that can impact mussel species and their fish hosts. A possible source of contamination is stormwater runoff from paved roads. Consequently the focus of the study is determining if highway runoff impacts freshwater mussel abundance and diversity. The ultimate goal being to identify strategies that supports the conservation of freshwater mussels and mussel habitat without impeding local economic development.

The study focuses on the upper Neuse River Basin, North of Chapel Hill and Durham. The relative distribution, abundance and diversity of freshwater mussels is being compared in areas with different adjacent land-uses. A non-lethal sampling technique has been developed to help evaluate mussel health, and results obtained using this sampling procedure will be compared with contaminant concentrations in sediment and mussel tissue samples.

NCDOT and Wildlife Commission staff have been involved at every stage of the process, including study site selection and the development of study protocols. Upon completion of the research, state personnel will help review the data and actively participate in designing more comprehensive studies focusing on the impact of runoff on mussel populations. This will give the state agencies first hand knowledge of the results to more effectively use in their everyday work.

The studies represent an important step toward the assessment of the impact of road runoff on mussel health. The non-lethal Sampling techniques utilized in this study have the potential to provide powerful new tools for DOT and NC Wildlife Commission biologists in their efforts to assess the health of freshwater mussel populations. Population health profiles utilized in this study could be used to assess the effectiveness of specific construction techniques in reducing runoff input into streams that are adjacent to construction projects. The Research should prove to be beneficial in minimizing the impacts to local fauna, improving highway project construction, and improving methods used in future research.

Project Investigators:
Jay F. Levine, College of Veterinary Medicine, and W. Gregory Cope, College of Agriculture and Life Science, North Carolina State University

Detours Answers:
1-F, 2-H, 3-C, 4-A, 5-G, 6-D, 7-E, 8-B

Acquiring Environmental Permits for Design-Build Projects

By: Lynn Smith, NCDOT Environmental Specialist
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Design-build (D/B) projects combine the design, construction, construction engineering, inspection requirements and testing requirements for a project into a single contract, all in accordance with standard North Carolina Department of Transportation (NCDOT) criteria, specifications and contract administration practices. These projects allow the contractor to pursue design revisions in an effort to reduce costs and expedite construction. The preparation of environmental documentation and the acquisition of required environmental permits and compensatory mitigation remain the responsibility of the NCDOT.

The particular D/B project I have been working on involves the widening of I-77 from I-85 in Charlotte to NC 73 North of Huntersville in Mecklenburg County (I-3311). The project is divided into two sections for funding and construction purposes (I-3311A and I-3311B). I-3311A is approximately 9 miles in length and is scheduled to be let November 2001. Section B is approximately 5 miles in length and is scheduled for post year construction.

Due to the nature of the D/B process, final impacts to natural resources are not known prior to submitting the permit application package. Therefore, impacts are based on a worst-case scenario and are assessed by the Hydraulics and Roadway Design Units. All streams and wetlands, within the project right-of-way, must be delineated and shown on the preliminary plans; however, the proposed roadway design of the D/B project is only approximately 25% complete at the time the permit application is submitted. For that reason, it is imperative that the permit specialist keeps the regulatory agencies informed of any additional natural resources that are implicated by design revisions. Since this is a fast track process, the expectation of the NCDOT is that the regulatory agencies will provide a quick turn around for issuing the environmental permits.

With respect to I-3311A, the majority of the proposed work will be contained within the median. Jurisdictional stream impacts of approximately 162 feet, at three separate crossings, will occur inside the median, and no wetland impacts are expected to occur. Therefore, compensatory mitigation is not anticipated for this project as it is presently designed.

The regulatory agencies have been very cooperative in this new process. They have agreed to review a preliminary permit application in order to identify and correct any questions and concerns early so as not to delay issuance of the permit. It is important, but not necessary, that the permits be acquired prior to the issuance of the Request for Proposal (RFP) so that the contractor understands all of the responsibilities of the project prior to bidding. An RFP is a document describing the procurement process, forms the basis for final proposals and can become an element in the contract. The RFP for I-3311A is scheduled to be issued on September 15, 2001.

Application to the Division of Water Quality for a 401 Water Quality Certification was made on August 30, 2001 and included the draft FONSI, permit drawings and Pre-construction Notification (PCN). The Water Quality Certification was received on September 6, 2001 subsequent to the signing of the final FONSI. An application for a Department of the Army Nationwide (NW) 14 Permit was submitted to the US Army Corps of Engineers on September 6, 2001. It is anticipated the NW 14 Permit will be issued September 14, 2001. If final design plans indicate an increase in the reported natural resources impacts, a permit modification must be obtained prior to construction in the affected areas.

NCDENR-NCDOT-USACE
Mitigation Process Improvement Initiative

By: Phil Harris, PE
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The Mitigation Process Improvement Workshop was held from September 17-21 in Raleigh, North Carolina and included various state and federal resource agencies. The objectives of the meeting were to discuss the problems/ concerns of the current mitigation process being implemented by NCDOT and to develop a new or improved mitigation process that would be more effective in compensating for unavoidable impacts. Due to time constraints, more emphasis was put on creating a new process with the intent that the existing process could be improved on in a separate meeting to be held at a later date.

In developing the new process, it was the consensus that a more programmatic approach would be taken that would focus on the functional replacement and water quality attributes at an individual watershed level. It is the goal that in the new process, mitigation will be attained years in advance of the permit application and that the mitigation and permit processes would be de-coupled such that permits would no longer drive the mitigation process.

PD&EA Branch Holds Retreat

By: Locke Milholland
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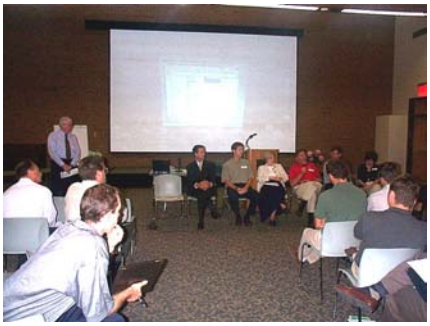
On July 16,2001 the Project Development and Environmental Analysis Branch (PDEA) held a retreat that was a relief for an otherwise routine Monday. The daylong event was conducted at the nearby Wake Commons facility. The Purpose of this event was to foster better communication practices, throughout the Branch, and beyond. It served to share the inner-workings of the various units, and promote an air of team spirit so that the branch as a whole can operate more efficiently.

The Retreat focused on several subjects. The topics included; an overview of the litigation process, and a demonstration of our legal council's abilities, a panel discussion with the managers answering questions, followed by a "Parade of Projects" sharing showcase projects. Staff participation was involved in some lighter aspects of the day, conveying the importance of updating scheduling systems and the unsuspecting headaches that can arise in the permit process. The last subject of the day was that of permit process improvement, intended to let the staff know how things are working to make the permit process more efficient.

The retreat gave all of the units in the branch a chance to have their questions answered about other aspects of the branch, which they might not be as familiar. It helped to broaden the horizons of many of those in attendance. The Retreat provided a relaxed atmosphere, away from the stresses of the office, allowing the staff to fully concentrate on realizing the shared goals of PDEA. Overall the retreat promoted that communication is a 2 way process between units, branches, other departments, and agencies. Without communication, the department of transportation enters a state of gridlock. Overall, the majority of staff participants rated the retreat as a success!



Project Update - The Wilmington Bypass (TIP No. R-2633C)

By: Gordon Cashin and Tim Bassette
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The first issue of Centerline profiled the Wilmington Bypass (TIP No. R-2633C) in the Project Spotlight by highlighting NCDOT's avoidance/minimization efforts for the Bypass. In this issue, we profile NCDOT's efforts to mitigate the impacts for this project. The section of the Bypass between I-40 and US 421 permanently and temporarily impacts 128.5 acres of jurisdictional wetlands and permanently impacted 10,740 linear feet of jurisdictional streams. Table 1 lists the authorized jurisdictional wetland impacts by habitat type, jurisdictional stream impacts, and the compensatory wetland/stream mitigation required by the project's environmental permits.
Finding suitable mitigation for such extensive wetland and stream impacts was no small task. The NCDOT hired a private firm, ECOBANK, to provide wetland mitigation for this project. ECOBANK identified and developed three mitigation sites that provided most of the wetland mitigation credits for this project. NCDOT also acquired a 176-acre parcel to preserve high quality bottomland wetlands immediately adjacent to the project and partnered with the North Carolina Wetland Restoration Program, an in-lieu fee program, to develop the remaining required mitigation for bottomland hardwood wetlands and stream impacts.

Habitat Type	Project Impacts	Restoration Mitigation	Enhancement Mitigation	Preservation Mitigation	NC Wetland Restoration Program	Total Mitigation by Habitat Type
pocosin/wet pine flat	102.6 ac	164.3 ac	117.7 ac	162.2 ac	0 ac	444.2 ac
bottomland hardwood	22.0 ac	16.5 ac	0 ac	176.0 ac	7.0 ac	199.5 ac
tidal wetlands	4.0 ac	8.0 ac	0 ac	0 ac	0 ac	8.0 ac
R-2633C wetland totals	128.6 ac	188.8 ac	117.7 ac	338.2 ac	7.0 ac	651.7 ac

Roadside Ditch Maintenance

By: Andru Wood
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The North Carolina Department of Transportation and its road easement maintenance contractors are responsible for thousands of miles of greenways that serve as habitats for countless numbers of wildlife. While roadway easements and ditches may not sound like ideal places for wildlife, in reality they really are. Roadside ditches that hold water year round or seasonally, may support fishes, frogs, turtles and all the little creatures these big animals eat, including insects crayfish and snails. Searching grassy fields and roadway shoulders with a butterfly net will reveal a wealth of insects and spiders that are food to countless songbirds, toads and lizards. And in the wooded areas fringing the roadway shoulders and easements are hawks, rabbits and squirrels, to mention but a few inhabitants.

The great many kinds and numbers of wildlife found along roadways has everything to do with basic ecology. The roadway easements create areas called edge habitats. Edge habitats are simply transition areas that occur when one kind of habitat meets another, for example, the shrubby zone between a forest and a field. This kind of edge may contain a mix of plants from both the woods and fields. The result is a narrow band of vegetation containing a rich assortment of plant types. This plant diversity in turn supports a great assortment of animals.

When water is added to the mix, as in the case of a roadside ditch, wildlife opportunities expand, making these watery zones all the more important to be careful around. Which brings us to the main subject of this conversation: roadside ditch and plant maintenance. Let me say up front that this article does not intend to address specific roadside management strategies and tools, or to tell people how to do their job. This article is meant to provide information for you to think about as roadside management strategies are developed, especially as concerns roadside ditch maintenance.

To begin, let me say that I am fond of roadside ditches. I spend considerable time exploring this common yet often overlooked aquatic habitat type. The range of plants and animals I have discovered in ditches ranges from little duckweed plants to stately cypress trees. And the animals I find in ditches are even more impressive including copepods, crayfish and other tiny crustaceans. Aquatic insects abound in ditches as do small fishes that eat the insects. Roadside ditches support countless tadpoles of frogs and toads that use the ditches as a nursery for their offspring. Aquatic turtles also inhabit ditches, including sliders, snapping turtles and in some places, the little spotted turtle, an animal whose numbers are in trouble due to habitat loss.

From my experiences as a ditch explorer, I can say the list of ditch denizens is a lengthy one. And the reason I make this point stems from the fact that these animals suffer when we run heavy equipment into the ditch to lop-off shrubs or mow-down emergent grasses. We also jeopardize water quality and wildlife needs when we spray plant-toxic herbicides over and into ditches.

I understand ditches and roadsides must be maintained for safety and other reasons. I also realize equipment and labor costs must be factored-in when developing management plans. However, I think we have reached a point in our society where we can now factor-in other costs for doing business along our roadways. Including the costs incurred when we damage the health and well being of our roadside wildlife. Tourism is one of North Carolina's most important economic engines. And tourism that focuses on the environment, from bird watching to canoeing wooded streams, is a rapidly growing segment of our state's economy. There is value in the plants and animals inhabiting our roadside fields, woods and ditches because these places are connected to the bigger habitats people are traveling here to see and explore.

In a very real sense, our roadways are more than corridors that carry people, goods and services. Roadways and their easements serve as front-line corridor connections between our state's economy and the environment that supports it. And it is well known that the healthier an area's environment is, the healthier its economy will be.

As managers of our state's roadways, NCDOT and its maintenance contractors are at the same time stewards for the environment and our state's economy. Careful management of our roadway ditches isn't just good for wildlife; it's good for people too.

Employee Spotlight and Personnel Update

By: Staff

Christie L. Murphy

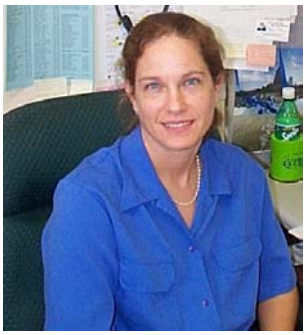
Christie Murphy is a Computer Consultant with the Natural Systems Unit. She joined the PDEA Branch in June 1996 as an administrative assistant. In December of 2000, she was promoted to the Natural Systems Unit.

In her current position, Christie's main role is database management. She is in the process of creating a database for the Natural Systems Unit to use to track highway projects and their impacts. The database will organize the work of teams, eliminate information overlap, and provide a reliable source of needed information. Christie's other duties include working with the Geographic Information Systems (GIS), producing power point presentations, and maintaining the Branch's WebPages.

While working full time, Christie attended Vance-Granville Community College. In August of 2000, she received her AAS degree in Information Systems.

Christie resides in Youngsville with her husband Brian, who is a Traffic Engineer with NCDOT. Christie enjoys outdoor activities, crafts, cooking and spending time with her family.

Elizabeth L. Lusk



Elizabeth Lusk is an Environmental Biologist with the Natural Systems Unit. She has been a member of the staff for two years, joining the Branch in August of 1999. Her hard work and experience has been welcomed.

Elizabeth received a Bachelor of Arts degree from Davidson College in 1985. In 1989, she attained a Master of Forest Management degree from Duke University. Elizabeth is a licensed North Carolina Registered Forester and a North Carolina Department of Agriculture Pesticide Applicator.

Elizabeth has served as a Baltimore County Forester with the Maryland Forest Service, and as a Service Forester with the NC Forest Service in Catawba and Iredell Counties. In 1994 Elizabeth joined CZR Environmental Consultants in Wilmington, NC. She worked there as a biologist gaining experience in bottomland hardwood mitigation, biotic community mapping, wetland delineation, vegetation analysis, and technical report writing. Since 1993, she has served on the Executive Committee of the NC Division of the Society of American Foresters.

Elizabeth's employment at NCDOT has allowed her to further utilize her skills. She continues to work on wetland and stream mitigation and delineation. She is currently overseeing several consultants who have been contracted to produce Natural Resource Technical Reports and permit applications, as well as mitigation searches.

In Elizabeth's spare time, she enjoys, reading, quilting, hiking, canoeing, and repelling.

We say goodbye to Michael Wood and Logan Williams.

Michael Wood has been a Soil Scientist with the Natural Systems Unit for five years. He is leaving the DOT to run his own soil and environmental consulting firm, The Catena Group. With a sigh of relief from the rest of the staff, Michael will continue to work a couple of days a week with NCDOT, maintaining project continuity.

Logan Williams is departing the NC DOT after 6 1/2 plus years of service, to join the NC Department of Agriculture and Consumer Services. Before working with DOT, Logan worked with NCDA and CS on pest management issues concentrating on bees. In his new position as Entomological Program Specialist he will be working with insect pests of North Carolina's agriculture and forestry industries.

We wish both of these individuals much success in their new positions!

In Memory of Mohammed B. Mustafa, P.E., August 5, 2001
Mohammed was our friend, a fellow staff member, and a contributor to our newsletter.
We will truly miss you!

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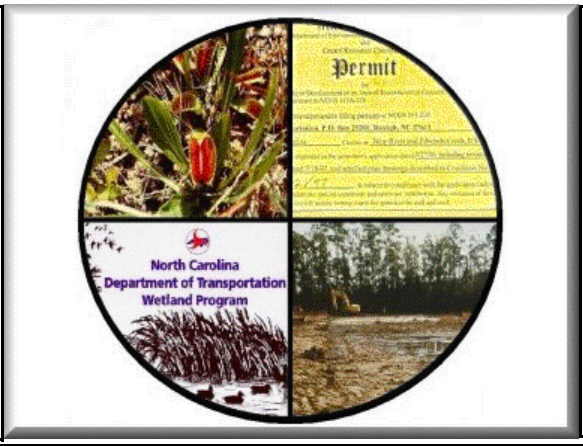

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Our Mission Statement

Each of the teams in the Natural Systems Unit is responsible for natural resource investigations, obtaining environmental permits, developing wetland and stream mitigation plans, and implementing the construction of mitigation sites.

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